Wuppertal Institut

in brief 10|2021

Sustainability Impulses from Wuppertal

Resilient, Sustainable and Ready for the Future: Guidelines for Urban Development of Tomorrow

Anja Bierwirth, *Head of Research Unit Urban Transitions, Wuppertal Institute*

Background

Cities and municipalities have had to endure a great deal in recent years, including a global coronavirus pandemic, fire disasters in the US and devastating floods like those in Germany. These are also consequences of anthropogenic climate change, and cities have to be better prepared for such events in future. In particular, the cata-strophic flooding Germany experienced in July 2021 demonstrated how ill-equipped municipalities are for this type of incident. In this In Brief, we look at how cities can become more resilient, sustainable and ready for the future.

1. The ability to adapt

Resilient people are just as affected by stress, tragedies and trauma as those who lack resilience. But resilient people tend to expect that things will get better in future and believe they are strong enough to overcome challenges themselves.[1] The same applies to resilient cities – they aren't simply immune to natural catastrophes, terror attacks, power cuts, pandemics or economic crises.[2] But they are capable of keeping the supply system and other (urban) systems and functions up and running in these extreme situations or reverting to alternatives in the event of a disruption. They are able to protect the health and lives of their residents. In other words, resilience in the urban context also means **the flexibility to adapt to new conditions.**

The same applies to the impacts of climate change, which include heavy rainfalls and floods as well as heat waves and periods of drought, storms and other extreme weather events and the risks they present to health, infrastructure and the economy.

---

1 Lenzen M. (no date): Resilienz lässt sich lernen. [Resilience can be learned.] Online book launch: Kalisch, R. (2017): Der resiliente Mensch. Wie wir Krisen erleben und bewältigen. [The resilient human. How we experience and overcome crises.] Berlin Verlag, Berlin. https://www.psychologie-heute.de/leben/artikel-detailansicht/38838-resilienz-laesst-sich-lernen.html (accessed 10/10/2021).

2 cf. also the below on this subject: Federal Ministry of the Interior (publisher) (2021): Memorandum Urbane Resilienz. Wege zur robusten, adaptiven und zukunftsfähigen Stadt. [Memorandum on urban resilience. Towards robust, adaptive and sustainable cities.] Download at: https://www.nationale-stadtentwicklungspolitik.de/NSPWeb/SharedDocs/Publikationen/DE/Publikationen/memorandum_urbane_resilienz.pdf?__blob=publicationFile&v=4 (accessed 10/10/2021)

2. Ready for the next flood

Resilient cities are not completely protected against damage, but they are capable of mitigating serious effects. Floods are a suitable example for identifying various fields of action around urban resilience:

Planning and construction

- **Flood plains** are a key element of flood protection measures. The designated areas are subject to stringent restrictions with respect to building or expanding developments. These surfaces are inundated when floods occur, reducing peak water levels and thereby protecting adjacent areas.
- **Basements** often fill with water during floods. Damage can be minimised by constructing buildings without basements, moving sensitive installations such as heating systems and fuse boxes to higher floors or elevating buildings. **Structural and technical measures** can also be implemented later on to protect buildings that already have basements against surface water from flooded streets or backwater from drainage systems seeping in.
- Structural installations can be specifically designed to serve as **inundation areas** (retention areas) and may include underground car parks as well as open spaces and city squares. They fulfil the same role as natural flood plains by lowering the peak flood level. This is particularly relevant in densely built-up and paved-over areas where precipitation cannot infiltrate into the ground naturally and drainage systems are therefore overloaded during heavy rainfall.
- **Natural infiltration and retention** must be improved in densely built-up urban areas in particular, for example by removing paving and creating green roofs.

Infrastructure

- In areas severely impacted by last summer's floods in Germany, the power supply, roads and other traffic infrastructure were destroyed along with social infrastructure such as nurseries, schools and healthcare facilities. **Redundant systems and installations** can compensate for these losses. Spaces, buildings and facilities should be designed for multiple functions, for example a church hall also serving as temporary accommodation or the option of quickly re-purposing a school as a meeting point for people seeking help.
- A **decentralised power supply** also boosts urban resilience. While floods can affect large areas, as demonstrated by the most recent one, they are nevertheless regional in scale. Energy infrastructure that is still intact in neighbouring regions can then also temporarily supply people affected by an outage.

Social resilience

- **Societal cohesion and civic engagement** also play an important role in making cities resilient. The recent flood disaster wasn't the first incident that demonstrated in impressive fashion how willing people are to help spontaneously and in any way they can. Whether in their own neighbourhood, their own community or from surrounding areas that were affected minimally or not at all – numerous people arrived in an incredibly short time and helped to clear out the flooded houses, clean the streets and provide necessities to those affected and their helpers. Others provided support by making material and financial donations. This spontaneous assistance on the part of civil society is incredibly valuable and must be encouraged and supported. If directed and utilised in an organised manner, it can reduce the burden on professional institutions such as technical relief organisations and fire brigades.

Information and education

- The population as a whole – and not just professional emergency personnel – must be **trained to respond to emergencies.** Because a warning will only be of use if those receiving it know how to assess it and what steps they need to take.

  After all, very few people living today have experienced a once in a century event like the floods of July 2021. As a result, disaster warnings can easily lead both decision-makers and the civilian population to conclude that 'it won't be that bad'.

  Examples from other countries show that training helps people better assess such situations: Schoolchildren in Japan are taught what to do in the event of an earthquake. In Bangladesh, they learn how to interpret flood warnings and what steps to take – to help themselves as well as their families and neighbours.[3]

3. Focusing on synergies

Construction and housing

- In many cases, climate protection and adaptation, conserving land and resources, protecting health and social justice are viewed as conflicting aims. As a result, higher energy demands are often regarded as price drivers for construction and housing. According to some, increasing housing density in cities would prevent the necessary greening process and cooling during hot spells. But growing cities and regions in par-ticular need more affordable living space. On the other hand, building on open space in the commuter belt goes against the goal of reducing land use.

- But these circumstances don't just involve conflicting aims – there are **synergies** as well. These synergies become evident when we superimpose different **overall concepts for urban development** on top of each other. Looking at floods as an example, we can see that setting aside more green, retention and infiltration areas not only makes cities more resistant to catastrophic floods. These areas also help to cool densely built-up areas of the city during summer heat waves. If there is a lack of areas with level terrain, buildings can be greened – on façades and roofs. Greening also has positive effects in terms of energy, because greening buildings prevents them from getting as hot in the summer and becoming as cold in the winter. This saves cooling and heating energy.

Transportation

- We can't protect the climate without a **mobility transition**. Reducing motor traffic in our cities is an indispensable part of this. Areas that are still used to park cars – which are parked for an average of 23 hours a day – can be turned into green areas adjacent to public streets. This not only **benefits the climate** but our **mental well-being**, too. Moreover, green paths encourage people to travel on foot or by bike which, in turn, **promotes health**. Trees create shade, which is vitally important on hot days. In addition, reducing traffic makes cities safer for more vulnerable road users in particular, so this is also a key part of **ensuring cities are child-friendly.**

  In other words, there are a number of positive reciprocal effects between greening urban areas, climate protection and climate adaptation as well as our health and efforts to protect it.

---

[3] cf. interview in Zeit online newspaper: https://www.zeit.de/wissen/umwelt/2021-07/bangladesch-klimaforscher-hochwasser-tipps-deutschland-wetterextreme-klimawandel-saleemul-huq (accessed 10/10/2021).

Social justice

- Reducing traffic, making cities greener and by doing so creating living environments that are healthier and more environmentally friendly promotes social justice in cities. So-called heat islands occur especially in densely populated areas that are largely paved over. In many cases, people in these areas live in homes that are too small on busy roads, without having access to high-quality green and open spaces nearby. They are particularly affected by noise and poor air quality due to car traffic but often don't reap the benefits of having a street outside their door because they might be unable to afford a car.

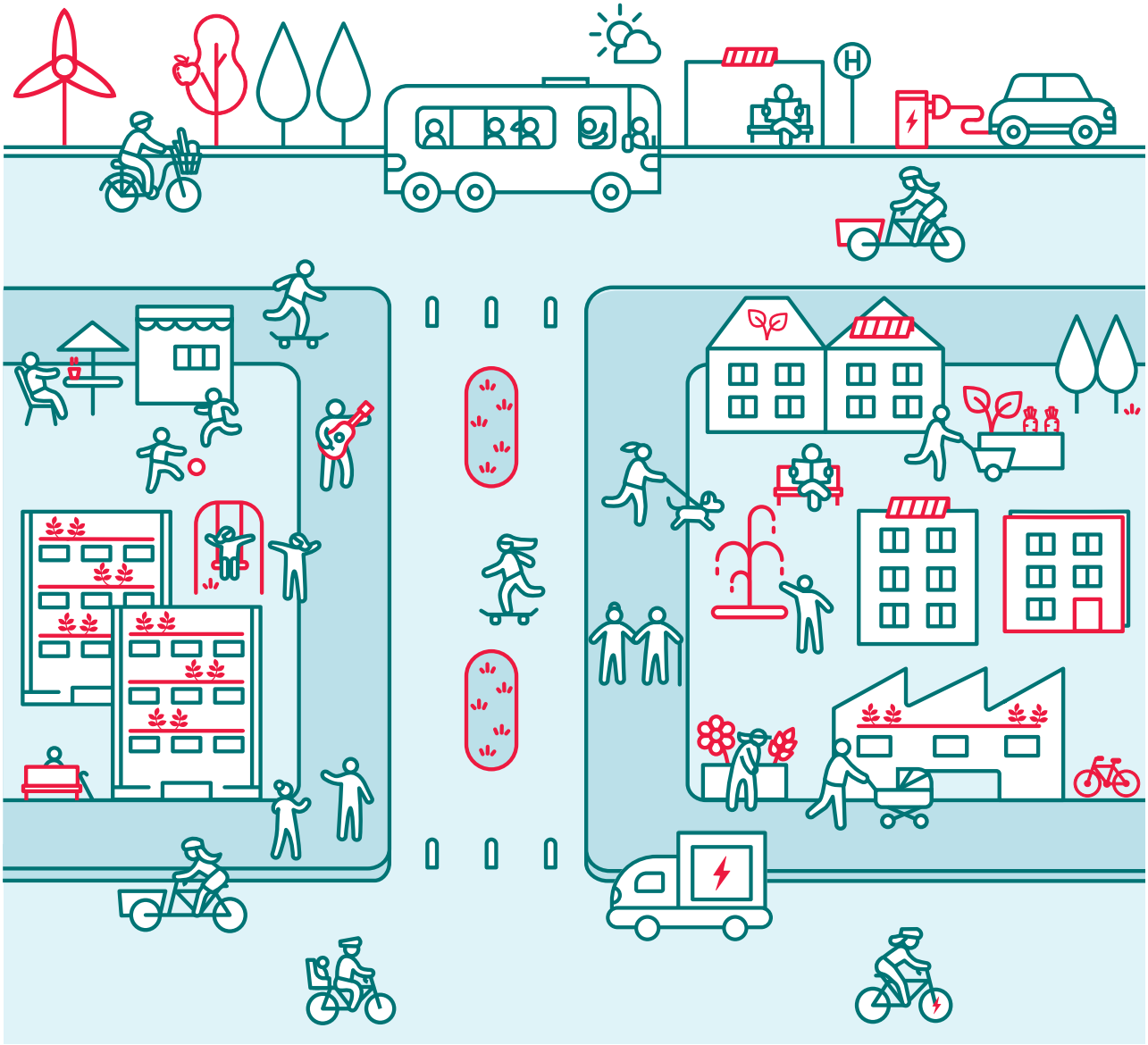

Image 1: Resilient, climate-neutral neighbourhoods that conserve resources offer an integrated approach to taking quality of life and social justice into consideration.
Source: Wuppertal Institute

4. Cities depend on the community to protect the climate

Germany has the massive economic and social restrictions caused by the **coronavirus pandemic**[4] to 'thank' for the fact that it did achieve its **interim climate target for 2020** – a 40 per cent reduction in greenhouse gas emissions compared with 1990 – despite predictions to the contrary. This wasn't down to ambitious climate protection policies. The revival of the economy, the return of freedom of movement, the mobility associated with it and the recurrent rise in emissions in many other areas that had been restricted up until now make it more than uncertain how we are to reach our even more ambitious target – climate neutrality by 2045.

One thing is for certain: Many cities are unable to achieve their climate targets on their own. They are dependent on climate-neutral electricity from Germany's national grid. The same is true of traffic on motorways and federal or state roads –and the demand for land for new buildings given that, for instance, municipalities have to adopt parking regulations that determine how many car parking spaces are to be created in the course of building projects.

5. Public administration can be obstructive

At the same time, **cities often hold themselves back** when it comes to achieving the goals they have set in terms of climate protection, climate adaptation, socially just cities and digitalisation. These 'cross-cutting topics' impact every area of municipal administration, but at the same time, conventional **administrative structures and processes** only rarely offer the scope for an integrated approach to planning and implementing sustainable urban development.

Meanwhile, these very same processes also complicate involvement on the part of citizens. Many people are actively committed to climate change and making cities greener, and they want to encourage travelling by bike and on foot and make it safer to do so. But efforts to **implement their ideas** fail because of approvals and lengthy **processing and decision-making procedures.** It takes time to convert, redesign and re-purpose what has already been built. Significantly speeding up the processes that make this possible is therefore all the more important.

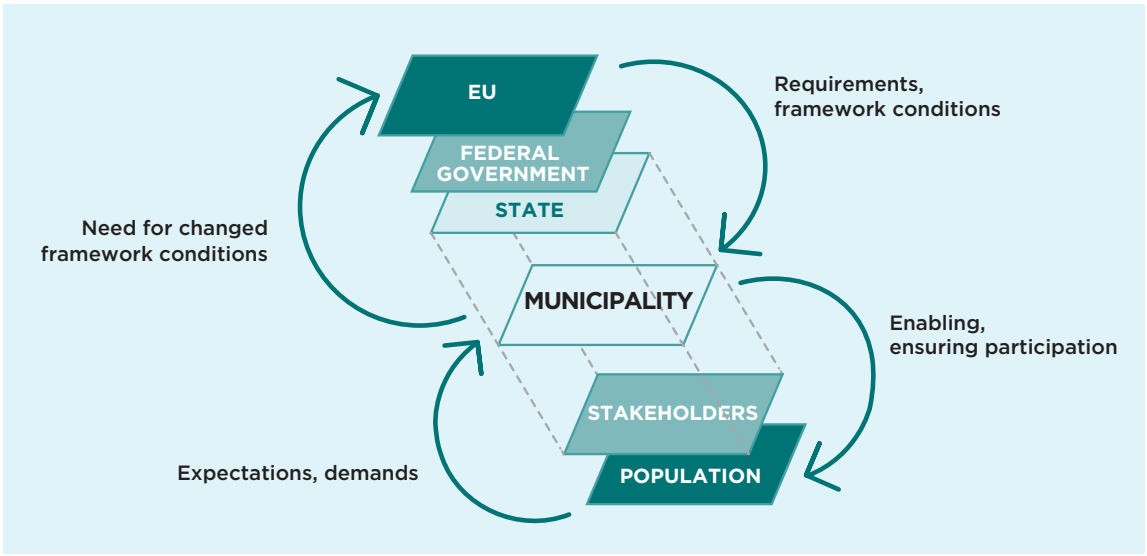

Image 2: Developing sustainable cities requires framework conditions and ways of taking action at all levels of government.
Source: Wuppertal Institute

[4] cf. Agora Energiewende (2020): Auswirkungen der Corona-Krise auf die Klimabilanz Deutschlands. Eine Abschätzung der Emissionen 2020. Analyse. Download at: https://static.agora-energiewende.de/fileadmin/Projekte/2020/_ohne_Projekt/2020-03_Corona_Krise/178_A-EW_Corona-Drop_WEB.pdf (accessed 10/10/2021).

6. Summary: Challenges at every level of politics

Responsibility for the sustainable development of our cities can no longer be delegated down from one level to the next until it ultimately lands at a level that cannot handle this responsibility or is held back by restrictions. All levels must make use of and develop the opportunities available to them. Only in this way will we be able to create cities that are prepared for climate change.

This In Brief proposes five courses of action for sustainable urban development:

- **Binding land protection targets** are being agreed at the European level. Like climate protection targets, corresponding penalties will be imposed for these targets.
- In response, Germany's Federal Government is introducing a **moratorium on land use** which states that new development areas may only be designated in areas where the population is growing. However, all options for development within existing urban areas must be reviewed prior to this, and the states must support communities with this process. In addition, the support provided to climate protection and adaptation concepts at the municipal level is being expanded to include measures to conserve land and resources.
- As a result, Germany's federal states are making a **comprehensive database** available to municipalities. This database combines a register of vacant land, a register of fallow land, socio-demographic data and forecasts of housing requirements that take into account age-adjusted housing options. The parking space regulation is to be repealed.
- In the context of this new support, many municipalities are reworking **integrated urban development concepts** that include working sessions across administrative bodies and departments in addition to **participatory processes** with the general public. All relevant offices and decision-makers consult on the proposals arising from the district processes and make preparations for the corresponding implementations. This shortens processes within the administration to just a few months.
- A new **instrument** called a **'temporary experimental space'** is being introduced in **urban planning.** This makes it possible for particularly innovative projects from initiatives in a given district to implement their ideas rapidly and on an experimental basis with the support of the administration. This opens up scope for car-free districts, greening measures, housing projects in unused buildings, urban production, urban gardening and much more.

Further publications and links

- *Schneidewind, U., Baedeker, C.; Bierwirth, A., Caplan, A., Haake, H. (2020): „Näher" – „Öffentlicher" – „Agiler". Eckpfeiler einer resilienten „Post-Corona-Stadt". Zukunftsimpuls 14 | April 2020. Wuppertal Institute. Download at: https://epub.wupperinst.org/frontdoor/deliver/index/docId/7661/file/ZI14_Post-Corona-Stadt.pdf*
- *Federal Ministry of the Interior (publisher) (2021): Memorandum Urbane Resilienz. Wege zur robusten, adaptiven und zukunftsfähigen Stadt. Download at: https://www.nationale-stadtentwicklungspolitik.de/NSPWeb/SharedDocs/Publikationen/DE/Publikationen/memorandum_urbane_resilienz.pdf?__blob=publicationFile&v=4*
- *SCI4climate.NRW – Wissenschaftliches Kompetenzzentrum NRW für eine klimaneutrale und zukunftsfähige Industrie*
- *Lenzen M. (no date): Resilienz lässt sich lernen. Online book launch: Kalisch, R. (2017): Der resiliente Mensch. Wie wir Krisen erleben und bewältigen. Berlin Verlag, Berlin. https://www.psychologie-heute.de/leben/artikel-detailansicht/38838-resilienz-laesst-sich-lernen.html*
- *Agora Energiewende (2020): Auswirkungen der Corona-Krise auf die Klimabilanz Deutschlands. Eine Abschätzung der Emissionen 2020. Analyse. Download at: https://static.agora-energiewende.de/fileadmin/Projekte/2020/_ohne_Projekt/2020-03_Corona_Krise/178_A-EW_Corona-Drop_WEB.pdf*
- *Deutsches Institut für Urbanistik gGmbH (2021): Toolbox Umweltgerechtigkeit. Available online at: https://toolbox-umweltgerechtigkeit.de*
- *Wuppertal Institute for Climate, Environment and Energy (2016): „Resiliente Stadt – Zukunftsstadt". Im Auftrag des Ministeriums für Bauen, Wohnen, Stadtentwicklung und Verkehr des Landes Nordrhein-Westfalen (MBWSV). Download at: https://epub.wupperinst.org/frontdoor/deliver/index/docId/6614/file/6614_Resiliente_Stadt.pdf*
- *Kopatz, M. (2016): Kommunale Suffizienzpolitik. Strategische Perspektiven für Städte, Länder und Bund. Kurzstudie des Wuppertal Instituts für Klima, Umwelt, Energie. Download at: https://www.bund.net/fileadmin/user_upload_bund/publikationen/nachhaltigkeit/nachhaltigkeit_suffizienz_studie.pdf*

Wuppertal Institut für Klima, Umwelt, Energie gGmbH

Christin Hasken
Head of Communications and Public Relations
Döppersberg 19
42103 Wuppertal · Germany
Phone +49 202 2492-187 · Fax -108
pr@wupperinst.org

Berlin Office
in the Stiftung Mercator's ProjektZentrum Berlin
Neue Promenade 6
10178 Berlin · Germany
Phone +49 30 28 87 458-10 · Fax -40
buero.berlin@wupperinst.org

wupperinst.org